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-USSR-

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MEANS OF PREVENTING THE MAIN CARDIO-VASCULAR DISEASES

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[Following is the translation of an article by Prof D. M. Abdullayev, of the Chair of Hospital Therapy, Russian Sector, Azerbaydzhan State Medical Institute imeni N. Narimanov, which was read at the plenary session of the Azerbaydzhan Scientific Medical Society, 12 April 1960, and published in Azerbaydzhanskiy Meditsinskiy Zhurnal (Azerbaydzhan Medical Journal), No 9, Baku, 1960, pages 3-9.]

The prevention of cardio-vascular diseases is one of the timely problems of clinical medicine.

The urgency of this problem is to be explained primarily by the fact that cardio-vascular diseases, and particularly their main nosological forms (hypertension, atherosclerosis and coronary failure), have lately become considerably more frequent, causing a high percentage of disability and mortality.

According to the data given by US authors, the cause of death in half of all cases in the US is disease of the cardio-vascular system. A similar situation also exists in other capitalist countries.

In the Soviet Union, mortality from cardio-vascular diseases is considerably lower: only half as high as in the US and 40 percent of that in Great Britain. Nevertheless, in our country, too, pathology of the cardio-vascular system occupies a prominent place among other diseases of the organism. This requires the most serious attention as regards elaboration of the proper prophylactic and curative measures.

Dispensary treatment of patients is of great importance in the prevention of cardio-vascular diseases. Being a synthesis of prophylactic and curative work, it ensures recognition of the disease in its initial forms and ascertains the working and living conditions which enables one to designate the correct prophylactic and curative measures. Among these are the wide development of physical culture and sports, and sanatorium and health-resort treatment, affording a strengthening of the organism and its nervous system.

Of greater importance in strengthening the nervous system is the normal duration of sleep. The gymnastics which have lately been performed in industry should also play and do play a positive role in this respect.

Consideration must be given to the harmful effect of alcohol and smoking on the cardio-vascular system. Alcohol causes a contraction of the vessels innervated by the celiac nerves and contributes to a considerable fluctuation of the blood pressure in hypertensives. According to M. P. Nikolayev's data, in the chronic use of alcohol there is a persistent widening of the brain vessels with an inclination toward their rupture. Our electrocardiographic investigations have also shown that nicotine impairs coronary circulation and causes a spasm of the coronary vessels. Hence, the combating of alcoholism and smoking, especially among patients suffering from cardio-vascular diseases, is of great prophylactic significance.

At the same time, in each specific case, one must take into account the etiology and pathogenesis of the cardio-vascular ailment, as well as the reactivity of the organism, for the correct institution of prophylactic and curative measures.

In speaking of the prophylaxis of the main nosological forms of cardio-vascular diseases, one must dwell, first of all, on hypertension as a disease of great importance in the development of coronary failure and atherosclerosis.

A most important condition for the prophylaxis of hypertonic ailment is its discovery in the early stage of development, in the period of still unstable hypertension. The early phase may pass over more or less rapidly to the next stages, more severe in their clinical course and causing such grave complications as infarct of the myocardium, cerebral hemorrhage, and so forth. Hence, it is necessary to make extensive prophylactic investigations among the population to discover concealed, unrecognized forms of hypertonic ailment.

All hypertensives and persons in the pre-hypertonic phase should be duly dispensarized for the purpose of ascertaining the necessary working conditions, designating a regime of treatment for them, and sending them in due time to sanatoriums, health resorts, and the like (G. F. Lang).

Sanatorium and health-resort treatment is among the most important factors in the prevention and cure of cardio-vascular diseases and, above all, hypertonic ailment. Of great significance here is a complex of factors, among which are primarily rest, change of environment, psychic repose, curative physical culture and others contributing to a lowering of the excitability of the nervous apparatus regulating the tonus of the vascular system. If one takes into consideration here that heightened excitability of the emotional sphere of higher nervous activity is of substantial significance in the etiology and pathogenesis of hypertension, the beneficial effect of the complex of health-resort factors becomes fully understandable.

The respective observations made by us in Sanatorium No 1 of the 4th Administration, Ministry of Health Azerbaydzhan SSR, in Mardakyany, have convincingly shown that sanatorium treatment exercises a beneficial effect in the sense of normalization of the arterial pressure, especially in patients in stages I and II of hypertension. The same

must be said regarding day and night sanatoriums, which also favorably affect the course of hypertonic ailment.

In speaking of the greatly beneficial effect of sanatorium and health-resort treatment, we cannot fail to note the influence of the Baku climate on the course of hypertension. As is known, the climate of Baku is characterized by its own specific local winds (the so-called nordy [north winds]) having a negative effect on the course of hypertension in the sense of making hypertonic crises more frequent, resulting in complications in the form of infarct of the myocardium and seizure (insul't).

For the purpose of preventing hypertonic crises under the climatic conditions of Baku, we have worked out the following prophylactic measures: on nord days patients with high arterial pressure are prescribed sleep-inducing drugs with subcortical action (luminal, barbamil); they must be taken in small doses for one or two days. These measures have yielded definite results: rarefaction of the hypertonic crises and consequently, reduction of hypertonic complications (infarct of the myocardium, seizure).

If one considers that hypertension, as a rule, results later on in the development of atherosclerosis of the vessesl and coronary failure, the immense significance of prophylaxis of hypertension and its crises becomes understandable. In this connection, the new idea of the possible pathogenic unity of hypertension and atherosclerosis is very interesting.

According to A. L. Myasnikov's data, "either these two diseases, differing in nature, arise under closely similar conditions of environment in a definite circle of persons and mutually influence the course of the disease process, or else there exists a single disease which in some cases manifests itself as hypertension and in others as atherosclerosis, and most often by both syndromes simultaneously or successively."

This new idea, advanced by Prof A. L. Myasnikov regarding the interrelation between hypertension and atherosclerosis and the unity of the two nosological forms, is of fundamental significance and requires more thorough study.

As is known, the problem of atherosclerosis has of late been drawing the attention of internists and pathologists more and more. This is understandable, since atherosclerosis is the most widespread chronic disease observed in the second half of man's life; it affects the vessels of the most vital organs (heart, brain, and kidneys), narrowing their apertures, often to the point of complete closure, and causing infarct of the myocardium and cerebral hemorrhage.

It is now considered as established that the disturbance of lipoid metabolism plays an important role in the pathogenesis of atherosclerosis and that the alimentary factor in the development of this disease is not the sole one. "There exist complex endogenic factors which determine the development of the disease, among which the role of nervous and endocrine disorders should be especially stressed" (A. L. Myasnikov).

New data obtained by N. A. Anichkov, A. L. Myasnikov and their associates evidence the reversibility of the atherosclerosis process, which fact makes prophylaxis and therapy of this disease possible, at least in its initial stage.

For the prevention and treatment of atherosclerosis it is necessary, above all, to work out new diagnostic methods and perfect the existing ones for detecting and treating incipient forms of atherosclerosis, since the more pronounced cases of atherosclerosis of the blood vessels are comparatively easy to diagnose with the aid of laboratory-instrument methods (X-rays, electrocardiography, ballistocardiography, the method of determining the pulse-wave rate, piezography of the pulse, etc.).

Prophylaxis of atherosclerosis requires the application of integrated measures.

As is known, the nervous factor -- the neurotic condition -- is of great significance in the development of cardio-vascular diseases, particularly of hypertension and atherosclerosis. Hence, the treating physician should pay attention to those factors of the external environment which act upon the human organism and nervous system. Of importance in this connection are prophylactic measures aimed at regulating the work and rest regime: curative physical culture, sufficient normal sleep, etc.

It is essential to note that the nerve factor plays a large role also in the regulation of the lipoid metabolism. Investigations made in the Institute of Therapy of the Academy of Medical Sciences USSR have shown very conclusively that drugs (phenamin and others), increasing the excitability of the higher sections of the nervous system, raise the cholesterol level; drugs lowering the excitability of thebrain (for example, luminal) lower the cholesterolemia in atherosclerosis and hypertension patients.

The facts cited eloquently testify to the great importance, in the pathogenesis of atherosclerosis, of functional disorders of the nervous mechanisms underlying the pathologic changes in the cholesterol metabolism.

According to current ideas, food excessively rich in fats and cholesterol contributes to the development of atherosclerosis. "Patients whose food has for a long time contained excessive quantities of animal fats andcholesterol regularly reveal, under the knife, more severe atherosclerosis attacks than persons having a diet low in fats" (B. V. Il'inskiy). Hence, prophylaxis of atherosclerosis requires rational food, poor in cholesterol but rich in vitamins, and containing lecithin and the so-called lipotropic substances (choline, methionine, inositone, etc.), which prevent the infiltration of cholesterol into he artery walls. Of great significance in this respect is the "dietoporphylaxis" recommended by B. V. Il'inskiy to prevent and cure atherosclerosis. This diet is carried out in the form of a zig-zag formed non-cholesterol meal enriched with lipotropic substances, with limitation of the total calorage.

"DIETOPROPHYLAXIS" ACCORDING TO B. V. IL'INSKIY

Non-cholesterol meal	Meal with limited cholesterol	Prohibited (in case of hypercholesterolemia
First Course:	First Course:	First Course:
Vegetarian soups of vegetables, groats, and mushrooms (defatted)	Same as in the non-cholesterol meal, but also milk soups of skimmed milk, and borshcht without sour cream	Fatty soups and fatty fish soup.
Second Course:	Second Course:	Second Course:
Vegetables, macaroni, egg whites, skimmed milk curds, groats, or mushrooms.	Same as the non-cholesterol meal, and also lean meat, non-fatty kinds of fish, doctor's sausage.	Entrails, brains (fatty types), eggs in whole form, sausage, fatty kinds of meat and fish, caviar (fish).
Third Course:	Third Course:	Third Course:
Fruits, berries, and juices.	Fruits, berries, juices, skimmed milk, sour milk, non-fatty pastry.	Considerable quantities of cream, sour cream, rich breads, fatty pastry, tarts, cake, cream butter (over 25 g per day), fatty preserves.

As may be seen from this table, the author recommends two types of meal: the first, so-called non-cholesterol meal is intended for patients with a high cholesterol content in their blood and a high lecithin/cholesterol coefficient; this meal contains 100 g of albumins (of vegetable origin), 50 g of carbohydrates and 25 g of fats. The second meal, with limited cholesterol, is intended for patients with a normal or moderately raised level of blood cholesterol; it contains 120 g of albumins, 500 g of carbohydrates, and 50 g of fats.

According to B. V. Il'inskiy's data, the first meal often reduces the amount of cholesterol to the normal level in two weeks, after which the patients change to the second meal. At the same time, the patients are prescribed vitamin A, B_1 and ascorbic acid.

Our clinic's experience has shown that it suffices to introduce a small amount of sunflower oil (50 g) into the food ration (poor in fats)

in order to lower the hypercholesterolemia. Interesting in this direction are the investigations of our clinic associate, Docent G. M. Isazade, who has prescribed a fat load with cream butter (50 g daily) and vegetable butter (50 g daily) in cases of atherosclerosis and hypertension with hypercholesterolemia. These investigations have brought out the hypercholesterolemic effect of cream butter and the hypocholesterolemic effect of vegetable butter.

Along with rational feeding, great importance in the prophylaxis and cure of atherosclerosis is attached to the external factor: normalization of the mode of life, correct alternation of work and rest, physical culture, as well as vitamins -- particularly ascorbic acid and hormones.

As early as 1952 A. L. Myasnikov recommended ascorbic acid for the prophylaxis and therapy of atherosclerosis, as its administration in large doses retards the development of that disease.

The special investigations made at the Institute of Therapy of the Academy of Medical Sciences USSR (N. M. Lobova) have shown the advisability of the wide use of ascorbic acid as a means of prophylaxis against atherosclerosis in the early stages of its development. This conclusion is founded on the fact that ascorbic acid has caused the greatest positive changes in the lipoprotein of sufferers from atherosclerosis of stages I-II (according to A. L. Myasnikov's classification).

The mechanism of the action of ascorbic acid in atherosclerosis, according to A. L. Myasnikov, consists in raising the oxidizing processes, as well as in stimulating the function of the liver, so that the destruction and elimination of cholesterol from the organism are intensified.

Lately, hormone preparations (thyreoindin and sex hormones in indicated cases) have also begun to be used in the prophylaxis and therapy of atherosclerosis, but they require more thorough study.

In conclusion, the significance of the active dispensarization of atherosclerosis patients should be emphasized once again. For this purpose, mass investigations among the population ought to be instituted in order to discover those suffering from incipient forms of atherosclerosis, who should be subjected to systematic treatment. This method of prophylaxis, as quite rightly pointed out by A. L. Myasnikov, should be used above all with respect to those burdened with hereditary atherosclerosis; to persons with a high cholesterol content and inclination to obesity and gout, when the function of the thyroid gland and the sex glands is lowered; as well as to persons suffering from gall stones. In all these conditions there is a great propensity to the development of atherosclerosis.

In speaking of atherosclerosis prophylaxis, we must distinguish distinguish atherosclerosis of the coronary arteries, which often develops in a medium of atherosclerosis, resulting in the development of acute coronary failure or cardiac asthma, which are at the same time a signal pointing to a progression of the atherosclerosis process. Hence, in all cases where atherosclerosis is suspected, it is recommended that the blood be examined for cholesterol content, or rather the ratio between

lecithin and cholesterol, since this ratio varies not only in cases of pronounced atherosclerosis, but also in its incipient stages, when the process is easily subjected to reverse development.

For the prophylaxis and cure of atherosclerosis it is necessary to detect it early, which often presents definite difficulties. According to the laboratory data of Academician N. N. Anichkov, atherosclerosis of the coronary arteries is often combined with atherosclerosis of the aorta. According to our data, this combination is encountered in 80-90% of all cases.

Diagnosis of atherosclerosis of the aorta, established by roentgenologic examination, acquires definite significance for indirect judgment of the presence of atherosclerosis of the arteries as well. However, it must be stressed that atherosclerosis of the coronary arteries is not the only cause of coronary failure. Of no small significance are also functional changes: coronary angiospasms, caused by the disturbances of the higher nervous activity and of the regulation of the coronary circulation.

Thus, two factors play a role in the development of coronary failure: the anatomical and the functional-angioneurotic, which in various combinations determine the character of the course of coronary failure. And it is difficult to speak in each specific case about the predominance of the anatomical or the functional factor, since in a large number of diseases (hypertension, endarteriitis, sugar diabetes) early development of atherosclerosis is observed even at an early age. However, according to G. F. Lang, disturbance of the function of the nervous apparatus regulating the blood supply of the myocardium is of decisive importance in the origin of attacks of acute coronary failure. Hence, prophylactic measures should be directed above all toward eliminating the neuro-functional disorders, which underly the spasm of the coronary arteries, as well as the progression of the atherosclerosis process. Also of significance here is the increased propensity to thrombus formation, which may also result from functional disorders, when the atherosclerosis process is present.

It is essential to note that early clinical forms of coronary failure develop not only in coronary atherosclerosis but also in cardiovascular neuroses, in the incipient stages of hypertension, as a result of frequent spasm of the coronary arteries. Furthermore, it is known that acute coronary failure is not infrequently of a conditioned-reflex character and arises in exacerbations of diseases of the gastro-intestinal tract, the liver and gall passages. Elimination of these aliments removes reflex angina pectoris.

Thus, it becomes understandable that prophylaxis of coronary failure should require consideration of allthe above factors, on which prophylactic measures should be based.

Speaking of prophylaxis of coronary failure and its complications, one should also take into account the favorable effect of antispastic and anticoagulant agents (here we have in mind the use of purine [Russ: <u>turin</u>] derivatives and other vessel-widening drugs, as well as anticoag-

ulant therapy). The investigations made in this direction have shown the great prophylactic significance of anticoagulant therapy, particularly in patients with acute attacks of coronary failure and inclination to thrombus formation. The fact that the use of anticoagulating agents often kills anginose pains also points to a certain degree to the antispastic action of these preparations. Hence, in coronary failure with attacks of stenocardia and in cases of high prothrombin and blood fibrinogen indices, which often cause the formation of a thrombus with subsequent infarct of the myocardium, anticoagulant therapy is recommended as a prophylactic measure.

In cases of stenocardia in a medium of functional angioneurosis with normal readings of the prothrombin index and blood fibrinogen, the prophylactic measures should be directed toward eliminating the causal factor (emotional elements, mental experiences, neuropsychic overstrain, etc.). In this respect, great importance is attached to sanatorium and health-resort treatment, which has a beneficial effect on the organism as a whole and particularly on those mechanisms which regulate the activity of the cardio-vascular system and the coronary circulation.

Without specifically examining the complex of sanatorium and health-resort factors which have a favorable effect on the course of coronary failure, we should like to dwell briefly on strain stenocardia, when patients often find it hard to stand such measures as curative gymnastics, physical culture and sometimes walks in the fresh air, which cause a pain syndrome in them.

In such cases, the taking of drugs which widen the coronary arteries and contribute to elimination of the pain syndrome is recommended for the adaptation of the coronary vessels to these loads before exercise. This affords a definite training of the cardio-vascular system of coronary-failure patients.

Likewise, of no small significance is the question of the work placement of coronary-failure patients. It is known that working capacity is, as a rule, reduced in cases of coronary failure. It is a matter of course that in coronary failure of degree I, when attacks of stenocardia are rare and less pronounced, light physical work is not contraindicated, if, of course, it is not connected with nervous strain, is normalized and a daily break in the work is provided for. As regards coronary failure of degree II, when there are frequent and pronounced attacks of stenocardia, work connected with physical or mental overstrain is contraindicated because of the considerable reduction in working capacity. In the more pronounced degrees of coronary failure, the patients become incapable of work, though an individual approach is required in each specific case to solve this question.

Thus, in the prophylaxis of cardio-vascular diseases the application of a complex of measures (improvement of working and living conditions, lengthening of physiological sleep, curative gymnastics, sanatorium and health-resort treatment, administration of sedative and antispastic drugs, etc.) contributes to normalize the function of the central nervous system and the mechanisms regulating the activity of the cardio-vascular system. Received 24 May 1960.

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